AM-FM STEREO RECEIVER

# model Nine GX

INSTRUCTION MANUAL

KENWOOD

## INTRODUCTION

The purpose of this manual is to acquaint you with the operating features of this receiver. You will notice that in every detail of planning, engineering, styling, operating convenience, and adaptability, we have sought to anticipate your needs and desires.

We suggest that you read through this manual carefully. Knowing how to set up the receiver, to the best advantage, will enhance your listening pleasure right from the start. You will also become aware of the ease with which you can adjust the receiver to meet your special requirements.

## SERIAL NUMBER

Record your SERIAL NUMBER on the spaces designated on the warranty card. You will find the serial number on the back of the receiver.

## AFTER UNPACKING

After unpacking, we recommend that you inspect the receiver for any possible shipping damage. If your receiver is damaged or fails to operate, notify your dealer immediately. If your receiver was shipped to you directly, notify the shipping company without delay. Only the consignee (the person or company receiving the receiver) can file a claim against the carrier for shipping damage.

We recommend that you retain the original carton and packing materials to prevent any damage should you transport or ship your receiver in the future.

## INSTALLATION PRECAUTIONS

a) Avoid locations subject to direct sunlight.
b) Avoid high or low temperature extremes.
c) Keep the receiver away from heat radiating source.
d) Choose stable locations with as little vibration and dust as possible.

## WARNING:

TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE

**IMPORTANT!**

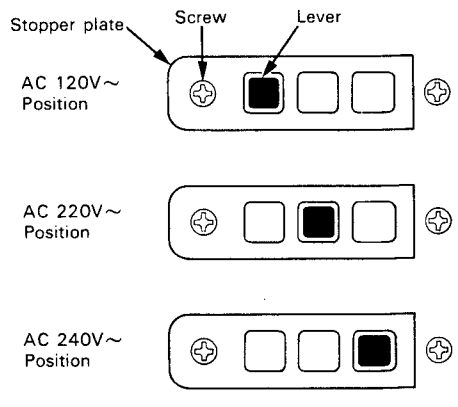
**It is very important to check the Voltage Selector Switch setting and make sure that it corresponds to your line voltage before connecting the power cord into an AC outlet. If the Voltage Selector requires re-setting, farther details as follows.**

## AC VOLTAGE SELECTION

This receiver operates on AC 120V, 220V or 240V. The AC Voltage Selector Switch on the rear panel is set to the voltage that prevails in the area to which the unit is shipped. Before connecting the power cord to your AC outlet, make sure that the setting position of this switch matches your line voltage. If not, it must be set to your voltage in accordance with the following direction.

**Note:**

Our warranty does not cover damage caused by excessive line voltage due to improper setting of the AC Voltage Selector Switch.




1. Remove screw and stopper plate.
2. Slide lever to your line voltage.
3. Lock lever with stopper plate and screw.

**AC VOLTAGE SELECTOR SWITCH**

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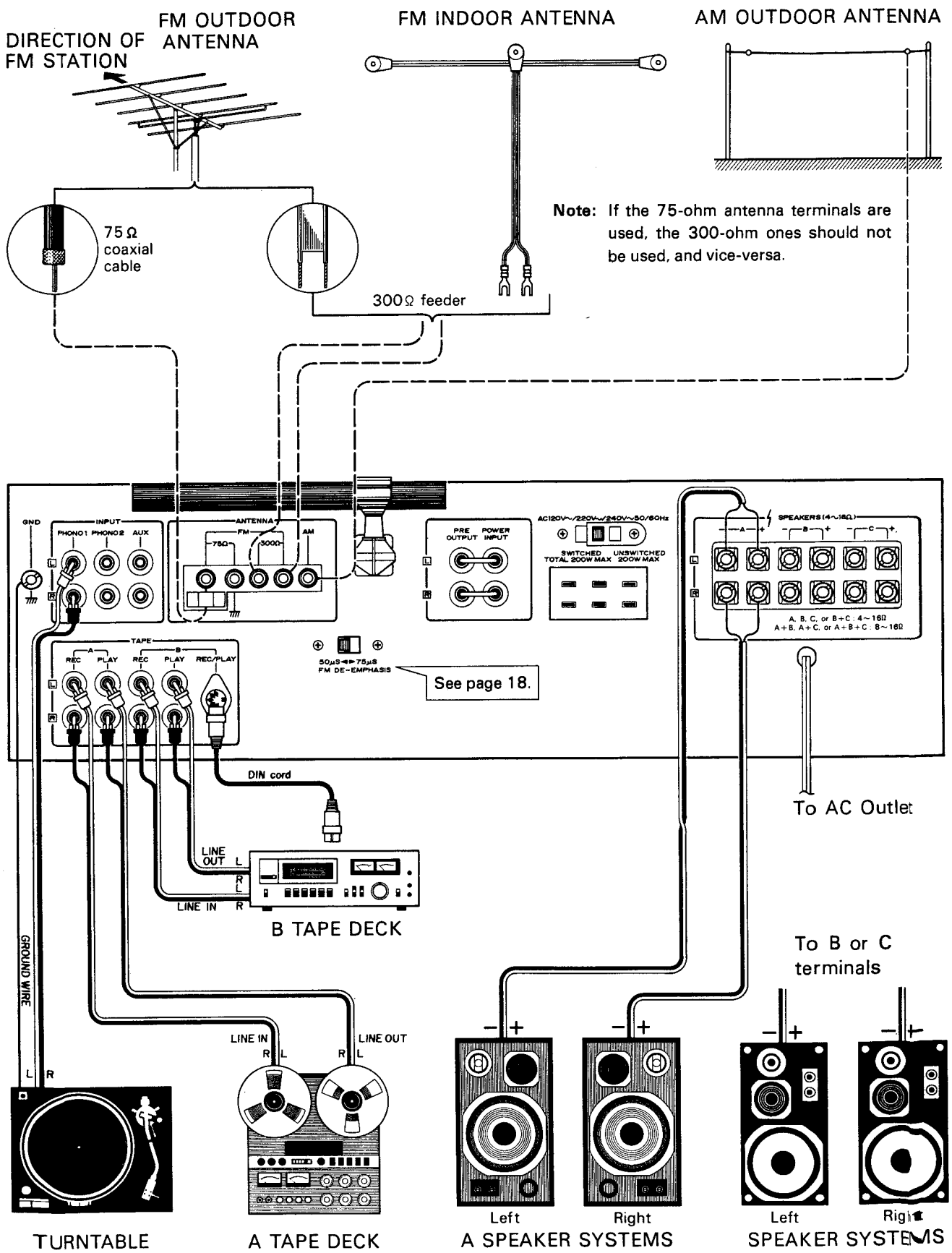
# FEATURES

1. 80 watts per channel, min. RMS both channels driven at 8 ohms 20 Hz to 20,000 Hz with no more than 0.03% total harmonic distortion.
2. Complete Dolby* facilities for all program source.
   a) Reception of Dolby encoded FM program.
   b) Taping of Dolby encoded FM programs with simultaneous decoding and monitoring.
   c) Dolby encoding when taping from any program source, Dolby recording of any Dolbyized tape.
   d) Providing the Dolby circuit to a tape deck without Dolby NR.
3. Automatic 2-hour Shut-off Timer Control.
4. Two POWER/LINE LEVEL meters for checking power output level, input level and calibration level of Dolby NR system.
5. Bass, Mid and Treble's Triple Tone Controls with true defeat switch.
6. Useful push bottom type input SELECTORS.
7. MIC MIXING system for adding a voice of your own.
8. High sensitive, low distortion FM station reception.
9. Many useful functions: Dolby NR mode selector, 400 Hz oscillator for calibrating the Dolby NR system, Recording and play level adjustor for Dolby NR system, Power meter range selector 3/150W, Loudness control, Mode selector Mono/Stereo, FM Muting, Subsonic Filter, High Filter, De-emphasis selector 50/75 $\mu$s etc.

* Dolby and the double-D symbol are trade marks of Dolby Laboratories.
Noise reduction system is manufactured under license from Dolby Laboratories.

# SYSTEM CONNECTION DIAGRAM



# SYSTEM CONNECTIONS

### 1. One Pair of Speakers

The speakers should be connected to the A terminals. Only the corresponding speaker A button on the front panel should then be pushed to activate these speakers.

### 2. Two Pairs of Speakers

Connect the two pairs of speakers to the A and B speaker terminals. Push A button for A and B button for B speaker system response. Push both A and B buttons in if you wish to have speaker response from both systems.

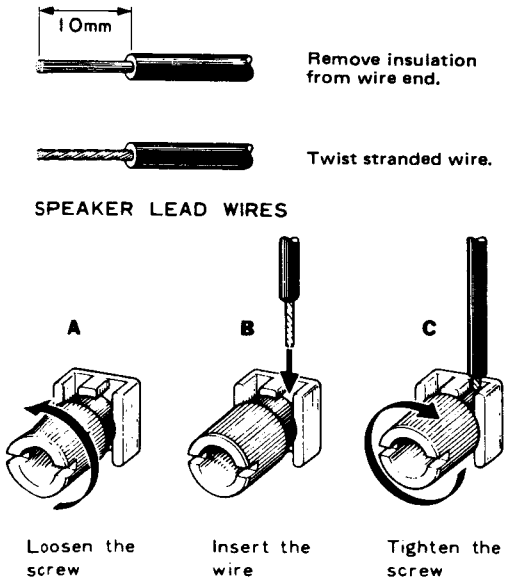
**Note:**
No response will be obtained if both B and C buttons are pushed in when only one speaker is thus connected.

### 3. Three Pairs of Speakers

Connect the three pairs of speakers to the A, B and C speaker terminals.
Push in only the corresponding button of the speaker system from which response is desired.

**Note:**
If three pairs of speakers are used at the same time, a speaker system must have an impedance of 8 ohms or more.

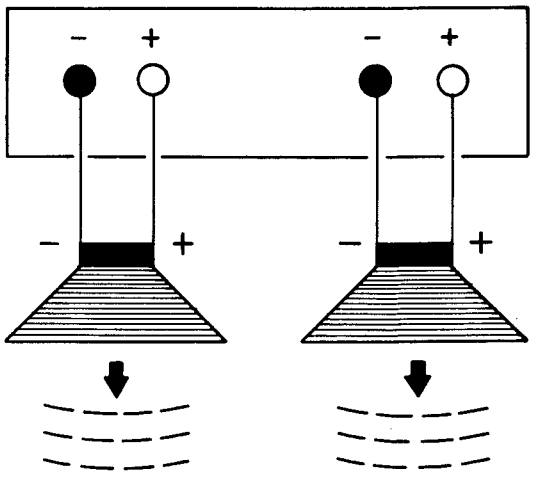
It is recommended that the tips of the speaker cord leads be soldered, or the strands of individual leads be twisted together to eliminate any possibility of short-ircuit in the speaker connecting network. Refer to the figure below.



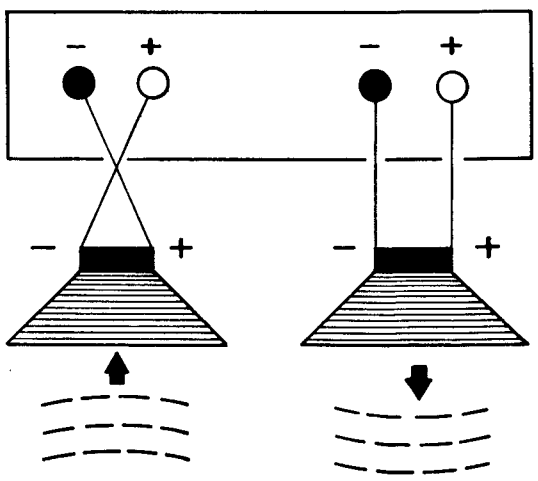

### Correct Speaker Phasing

When connecting speakers to the speaker terminals of the unit, be sure that the polarity of the speakers and the unit terminals correspond properly; that is, connect the positive terminal marked (+) of the speaker to the positive terminal of the unit, and the negative terminal marked (—) of the speaker to the negative terminal of the unit. Speakers so connected to the unit terminals provide proper bass response in sound reproduction, see Fig. A.
Improper speaker connection, see Fig. B, gives poor bass response in sound reproduction. Connected in this way, the bass speaker cones are moved in oposite directions reducing bass response.

A



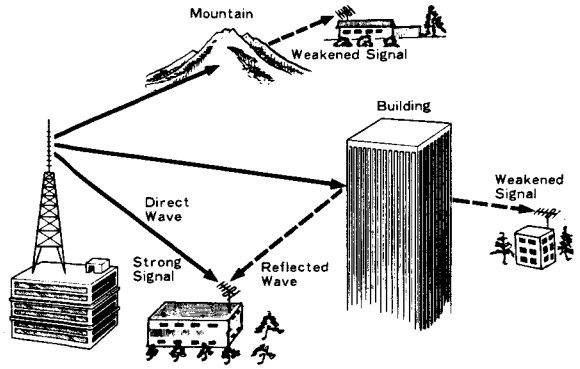

B



# SYSTEM CONNECTIONS

## FM ANTENNAS

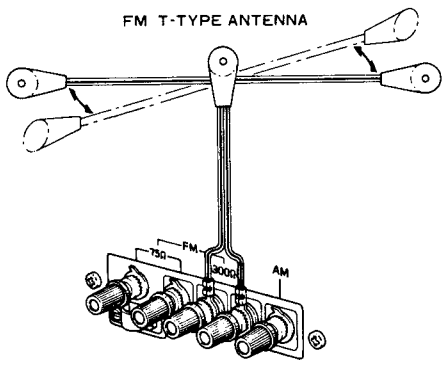
Since FM broadcast signals travel along a straight and direct-line path, they become rather weak behind hills and buildings even in the vicinity of a transmitting station. FM signals also become weak in areas distant from a station even though there may not be any obstruction to the direct-line path of the signal. Therefore, a good FM antenna should be installed in the most effective manner for the best possible FM reception.




DIRECT WAVE AND REFLECTED WAVE

### FM Indoor Antenna

In areas close to the transmitting station, the supplied T-type antenna may suffice. Spread two arms of the antenna horizontally and position them for the best reception, listening to an FM station. The antenna can then be taped to a wall or ceiling and must not be rounded nor folded. It should be remembered, however, that the pickup of reflections (similar to "ghosts" on TV) will result in poor stereo reception. These reflections must be reduced to a minimum, either by careful orientation of the T-type antenna or, if this will not eliminate them, by using a more directional outdoor antenna.

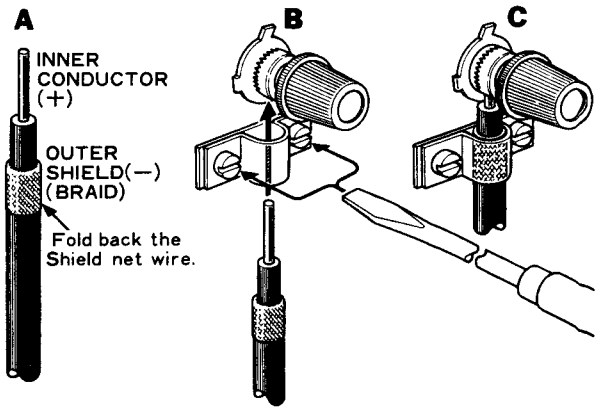



TWIN LEAD (300Ω) CONNECTION

### FM Outdoor Antenna

In areas at a greater distance from the transmitting station, the use of an outdoor antenna is highly recommended. It is available in various types. For reception of stations located in many directions, a non-directional type antenna will offer better results. When using a directional antenna, always orient it for the best reception of the desired station. The correct position will be indicated by maximum deflection of the SIGNAL meter on the unit.

If a coaxial FM antenna cable (75 ohms) is to be connected, the connection is shown as follows.




Strip the coaxial cable as shown in (A).
Loosen the screws and connect the cable as shown in (B).
Then tighten all screws for a connection like (C).

COAXIAL CALBE (75Ω) CONNECTION

## AM ANTENNAS

The AM ferrite bar antenna incorporated in this receiver assures satisfactory reception of all local AM stations. Since the ferrite bar antenna has directional purposes, you should adjust the antenna to the position which brings in the strongest signal.

In fringe areas or in locations surrounded by steel frame buildings where satisfactory reception cannot be obtained with the ferrite bar antenna, an AM outdoor antenna should be connected to the AM terminal.

**Note:**

To prevent any possible radio interference, keep AC power cords and speaker leads away as far as possible from the AM ferrite bar antenna.

# SYSTEM CONNECTIONS

## TURNTABLES

The two shielded audio cables from your stereo turntable should be connected to the phono input plugs. Connect the left channel of the turntable to the PHONO 1 [L] input jack, and the right channel to the PHONO 1 [R] input jack.
If an additional turntable is used in order to operate two turntables, connect the left channel to the PHONO 2 [L] input jack, and the right channel to the PHONO 2 [R] input jack.
And either case, you should not forget to connect the grounding wire to the receiver's GND terminal to eliminate hum noise.

## TAPE DECKS

### Recording

A tape deck can be connected for recording as follows. Left channel input of the tape deck to the TAPE A REC [L] jack. Right channel input of the tape deck to the TAPE A REC [R] jack.

### Playback

A tape deck can be connected for playback as follows. Left channel output of the tape deck to the TAPE A PLAY [L] jack. Right channel output of the tape deck to the TAPE A PLAY [R] jack.

## DIN CONNECTOR (REC/PLAY)

If your tape deck is equipped with a DIN connector, connect it to the REC/PLAY connector with a DIN cord. The DIN connector enables recording and playback with this single cord. However, before connecting check whether the impedances at the DIN connecting terminals of the receiver and the tape deck are equal. If they are not equal, use RCA pin cords to ensure correct sound quality.

**Note:**
When the tape deck is connected to the receiver with a DIN cord, the TAPE B PLAY and TAPE B REC jacks should not be used.

## AUX (AUXILIARY)

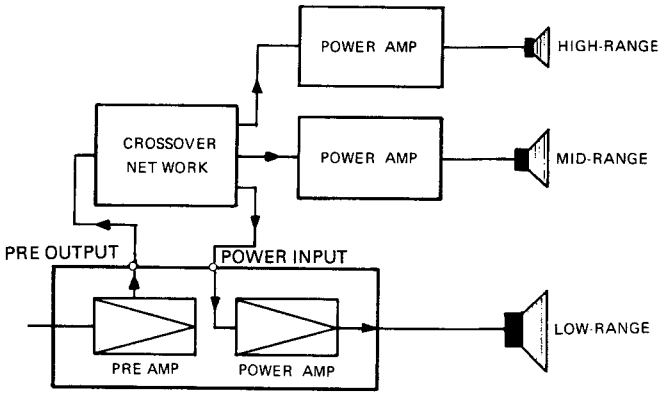
High level AUX input jacks are for miscellaneous sources, such as extra tape decks, additional tuners and other external components.

## PRE OUTPUT-POWER INPUT jacks

By utilizing these jacks and interconnecting with other equipment as shown in Figure below, the Model Nine GX can be used for multi-channel system. Moreover, by simply connecting an adaptor to these jacks, a 4-channel reproduction can be enjoyed.
In such a case, the bridge connecting plugs must be removed.
Use of the multi-amplifier system is as follows.

1. Remove both of the plugs bridging the PRE OUTPUT and POWER INPUT jacks.
2. Connect the PRE OUT jacks to the input jacks of the crossover network.
3. Connect the POWER INPUT jacks to the output jacks of the crossover network.

**Note:**
For detailed instructions on connections, etc., see the instruction manual supplied with the adaptor.



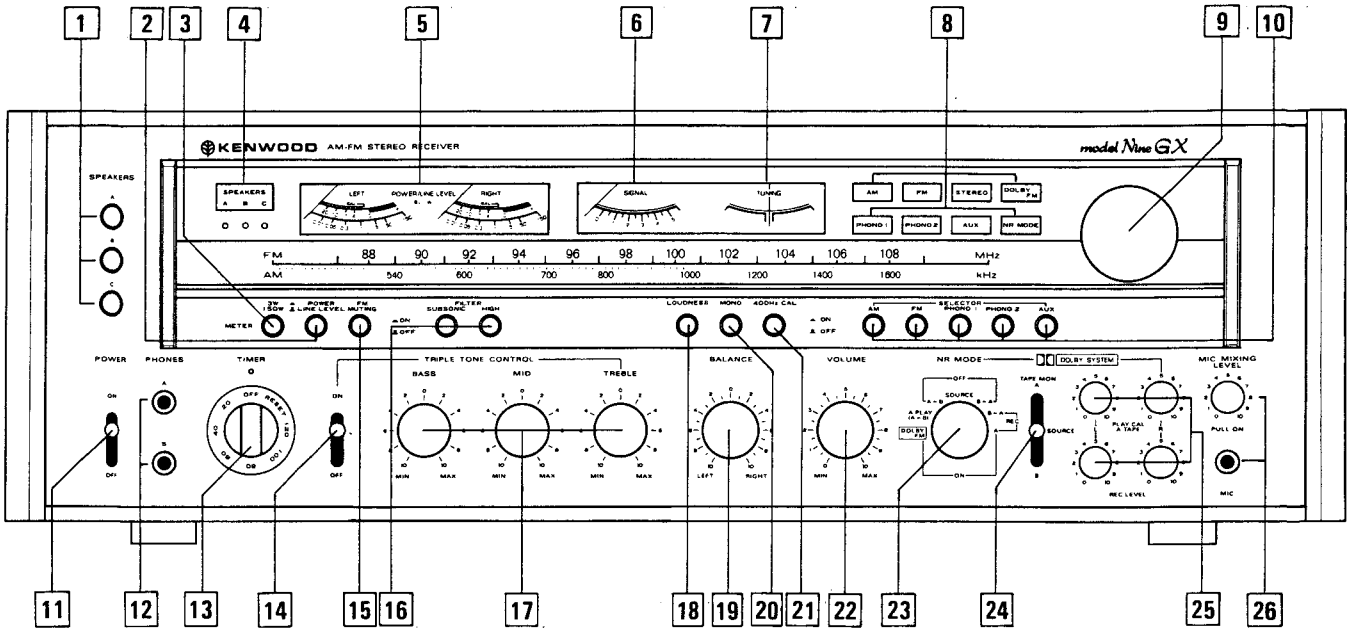

## AC OUTLETS

The AC outlets on the rear panel of the receiver may be used to supply power to other components such as a turntable, tape deck, etc.

1. SWITCHED outlets
   These outlets are controlled by the POWER switch and the Timer on the front panel. (The total capacity is 200 watts maximum.)
2. UNSWITCHED outlet
   This outlet delivers power at all times. (The capacity is 200 watts maximum.)

**Note:**
Never connect any equipment whose power consumption exceeds the capacity of each outlet.

# CONTROLS, INDICATORS AND CONNECTORS




**1 SPEAKERS**

**A** — Activates speakers connected to the SPEAKER A terminals on the rear panel.

**B** — Activates speakers connected to the SPEAKER B terminals on the rear panel.

**C** — Activates speakers connected to the SPEAKER C terminals on the rear panel.

For private listening through headphones, release all the SPEAKER buttons.

**2 POWER/LINE LEVEL switch**

This push button switches the meters to read POWER output or LINE signal levels. The POWER/LINE LEVEL meters indicate the power output level when the switch is depressed. When it is released, the meters indicate the line signal level.

**3 METER range switch**

This switch allows selection of meter sensitivities for POWER output. Set the switch to either the 3W or 150W setting in accordance with the strength of the power output.

**Note:**

To protect the meters from overswing, make it a rule to set the METER range switch to the 150W position. And push it in to the 3W position for a more sensitive reading only when the meter can hardly be read using the 150W switch position.

**4 SPEAKER indicator**

The lamps, A, B, and C, light to show which SPEAKER switches are engaged.

**5 POWER/LINE LEVEL meters**

**POWER** — When the POWER/LINE LEVEL switch is depressed, the meters indicate the power output level.

**LINE LEVEL** — When the POWER/LINE LEVEL switch is released, the meters indicate the line signal strength. In addition, the meters are to be used as Dolby CAL level meters when the 400 Hz CAL switch is depressed.

**6 SIGNAL meter**

This meter indicates the strength of the AM or FM signals received. It is used as a tuning aid for both AM and FM tuning and very useful in making antenna adjustments.

**7 TUNING meter**

This meter gives a precise indication of correct FM tuning. Maximum stereo separation and minimum distortion are obtained when the receiver is tuned to center the pointer on the meter scale.

**8 Indication lamps**

These lamps light to show which source has been selected by the SELECTOR switches and which mode has been selected by the function switches.

**9 TUNING knob**

AM and FM stations are tuned by turning this knob.

**10 SELECTOR switches**

**AM** — for reception of AM broadcasts.

**FM** — for reception of FM broadcasts.

**PHONO 1** — Audio from a turntable connected to the PHONO 1 input jacks.

**PHONO 2** — Audio from a turntable connected to the PHONO 2 input jacks.

**AUX** — Audio from a source connected to the AUX jacks.

**11 POWER switch**

**ON** — turns the receiver on.

**OFF** — turns the receiver off.

# CONTROLS, INDICATORS AND CONNECTORS

**12 PHONES**

Insert stereo headphone plugs into these jacks.

**13 TIMER control**

The model Nine GX is equipped with a TIMER control which enables the set to be switched off automatically at any predetermined time within two hours from the time of setting. If the predetermined time is set wrong unintentionally, for example, it has been set at 120 instead of 60, correction can be made by turning the TIMER control counterclockwise to the required time of 60. The TIMER control required more force to turn counterclockwise than clockwise.

**Note:**

When the TIMER control is set to OFF, the AC power remains off, regardless of the setting of the POWER switch. Therefore, the TIMER control must be set to RESET to operate the receiver. The AC convenience outlet on the rear panel marked SWITCHED 200W is switched by the POWER switch and TIMER.

**14 TRIPLE TONE CONTROL**

**ON** — This setting activates the BASS, MID, and TREBLE controls.

**OFF** — This setting switches in a bypass circuit to provide a linear frequency response, regardless of the tone control settings.

**15 FM MUTING switch**

In the "depressed" position, muting silences interstation noise during tuning. To receive very weak stations, stations that are too weak to overcome the muting threshold, disable the muting by pushing the switch to release.

**16 FILTERS**

**SUBSONIC** — Frequencies below 18 Hz are attenuated by 15 dB/octave. Although such subsonic frequencies are inaudible to the human ear, they can cause, intermodulation distortions and even damage the loudspeakers. It is advisable to leave the switch in at all times, even if no record rumble, etc. is heard.

**HIGH** — Pressing this button in (latched) reduces signals above 10 kHz at the rate of 6 dB per octave. Press this button in to lessen the effects of tape hiss, record scratches, etc. Press again to unlatch (button out) in all other cases.

**17 TRIPLE TONE CONTROL**

**BASS** — Turn clockwise to increase bass response, counterclockwise to reduce bass response.

**MID** — Turn clockwise to increase mid-range response, counterclockwise to reduce mid-range response.

**TREBLE** — Turn clockwise to increase treble response, counterclockwise to reduce treble response.

**18 LOUDNESS control**

The LOUDNESS control compensates for a natural deficiency in human hearing, the human ear is less sensitive to bass notes at low volume levels. Use the LOUDNESS control to give the best bass response at normal listening levels. In the OFF position response is flat. Use this setting for loud listening levels.

**19 BALANCE control**

This control permits balancing of left and right channels when an imbalance exists in the sound source, or to correct an acoustic imbalance due to room conditions. Turn it to the left, from the zero position, to boost the left channel; turn it to the right from zero to raise the level for the right channel.

**20 MONO switch**

The left and right channel signals are mixed together and can be heard from both speakers.

**21 400 Hz CAL switch**

This is used for calibration of the record input level of a tape deck. When the switch is depressed, the built-in oscillator operates and a sine wave signal is applied to the TAPE A REC jacks. The calibration level is displayed on the POWER/LINE LEVEL meters.

**22 VOLUME control**

This control adjusts left- and right-channel volume simultaneously. Set it for the desired listening level.

**23 NR MODE switch**

**OFF** — This position is for operation without using the Dolby unit.

**ON** — This position is for operation with using the Dolby unit.

PLAY for playback a Dolbyized recording from an incoming non-Dolbyized signal.

Further details on pages 16 and 17.

**24 TAPE MONITOR switch**

Switch positions and functions are as follows.

**SOURCE** — The source signal is heard.

**A** — For monitoring a recording or for playback on a tape deck connected to the TAPE A jacks.

**B** — For monitoring a recording or for playback on a tape deck connected to the TAPE B jacks.

**25 DOLBY LEVEL control**

**PLAY CAL A TAPE** — These knobs control the playback outputs from a tape deck to the proper Dolby level.

**REC LEVEL** — These knobs control the record level of the signals to be recorded through the Dolby unit. Adjust the knobs so that the LINE LEVEL Meter Pointer remains within the CAL zone of the POWER/LINE LEVEL Meter and the tape deck's VU meters indicate "0VU".

**26 MIC MIXING and MIC input**

MIC MIXING permits mixing of a signal from the mono microphone input jack with the desired source selected with the SELECTOR switch. To activate MIC MIXING, pull the knob and turn clockwise. When microphone sound is not required, turn the MIC MIXING LEVEL control fully counterclockwise and switch off by pushing in. Further details on page 11.

# OPERATING INSTRUCTIONS
## (WITHOUT USING DOLBY UNIT)

### AM-FM RECEPTION

1. Set the SELECTOR switch to AM or FM.
2. Set the MODE switch to STEREO (OFF) and the TAPE MONITOR switch to SOURCE.
3. Adjust the VOLUME control to the desired listening level.
4. Use the TRIPLE TONE CONTROLS, FILTER and LOUDNESS controls to adjust sound as desired and to match the acoustic conditions of your room.

### TURNTABLE OPERATION

1. Two pairs of phono input jacks, PHONO 1 and PHONO 2, are provided to enable connections to two turntables.
   To reproduce the output of the turntable connected to PHONO 1 jacks, set the SELECTOR switch to PHONO 1. To reproduce the output of the turntable connected to PHONO 2 jacks, set the SELECTOR switch to PHONO 2.
2. Set the MODE switch to STEREO (OFF) and the TAPE MONITOR switch to SOURCE.
3. Use the TRIPLE TONE CONTROLS, FILTER and LOUDNESS controls to adjust the sound to your preference and to the acoustic conditions of your room.

### TAPE DECK OPERATION

**Tape Monitoring**

If you use the receiver with 3-head type tape decks, you can check the sound quality of the recording being made momentarily by comparing the recorded signal with the source signal as follows. Set the TAPE MONITOR switch to A (or B) to monitor the recorded sound. Set the TAPE MONITOR switch to SOURCE to monitor the source signal before recording.

**When Recording with One Tape Deck**

Connect the tape deck to either TAPE A jacks or TAPE B jacks on the rear panel.

**Recording**

1. Set the SELECTOR switch to the desired program source. Set the TAPE MONITOR switch to SOURCE. To monitor the recording, set the TAPE MONITOR switch to A or B, whichever side the tape deck is connected.
2. Recording level should be adjusted with the volume control of your tape deck.
3. Recording is not affected by the VOLUME, TRIPLE TONE CONTROLS, FILTER, LOUDNESS, etc., controls of the receiver.

**When Recording with Two Tape Decks**

Connect one tape deck to TAPE A jacks and the other to TAPE B jacks on the rear panel.

**Recording**

1. Set the SELECTOR switch to the desired program source.
2. Set the TAPE MONITOR switch to SOURCE.
3. Recordings can now be made into both tape decks simultaneously. To monitor these recordings, use the TAPE MONITOR switch as follows. Set it to A to monitor the recording being made with the tape deck connected to TAPE A jacks. Set it to B to monitor the recording being made in the tape deck connected to TAPE B jacks.
4. Recording levels should be adjusted exactly as mentioned above for single tape deck operation.

**Playback**

1. The SELECTOR switch can be in any position.
2. Set the TAPE MONITOR switch to the corresponding position (A or B).
3. Adjust volume and tonal quality.

# OPERATING INSTRUCTIONS
## (WITHOUT USING DOLBY UNIT)

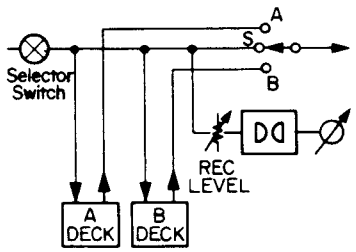
**Tape-to-Tape Dubbing with THROUGH CIRCUIT**

Tape recordings may be easily duplicated from one tape deck to the other by setting the NR MODE switch to OFF A ► B or OFF B ► A as follows:

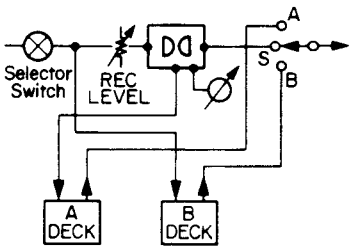
1. The SELECTOR switch can be in any position.
2. Set the NR MODE switch to OFF A ► B when it is desired to copy recorded material on the tape deck A for re-recording on the tape deck B.
   Set the NR MODE switch to OFF B ► A when it is desired to copy a recording on the tape deck B for re-recording on the tape deck A.
   The recording can be monitored. (If the TAPE MONITOR switch is set to SOURCE, SOURCE can be listened to even during the tape-to-tape dubbing. This is thanks to the THROUGH CIRCUIT.)
3. Operate both tape decks simultaneously.

**MIC MIXING WITH SOURCE PROGRAM**

1. Set the NR MODE switch to the SOURCE position and the SELECTOR switch at any program as you desired.
   Then turn on the MIC MIXING by pulling its knob.
   TAPE MONITOR positions are as follows.
   **SOURCE** ...Source program mixed with MIC input.
   **A**.....Playback sound of the TAPE DECK A (source with MIC).
   **B**.....Playback sound of the TAPE DECK B (source with MIC).




2. Set the NR MODE switch to the REC-A position and the SELECTOR switch at any program as you desired.
   Then turn on the MIC MIXING by pulling its knob.
   TAPE MONITOR positions are as follows.
   **SOURCE** ...Source program mixed with MIC input through the Dolby.
   **A**.....Playback sound of the TAPE DECK A (Encoded source with MIC input).
   **B**.....Playback sound of the TAPE DECK B (source with MIC).



# OPERATING INSTRUCTIONS
## (WITH USING DOLBY UNIT)

### OUTLINE OF THE DOLBY NR SYSTEM

The basic principle of the Dolby NR system is as follows. During the recording process, all low level, high frequency source signals above midrange — the area where noise is most discernible — are boosted automatically with a Dolby compressor circuit before being put on tape. During playback, the Dolby expander circuit automatically reduces these boosted signals to their original levels. At the same time, the tape noise introduced during the recording process is also reduced by the same amount. The end result is a significant improvement in the signal to noise ratio. This means that tape noise, in effect, becomes indiscernible to the ear.

The Model Nine GX receiver boosts highest fidelity sound reproduction thanks to built-in Dolby NR system which processes signals from all sound sources. This means that FM programs can be of equivalent audio quality as those reproduced from your "denoised" tapes.

### RECEPTION OF DOLBYIZED FM BROADCASTS

When the transmission of Dolbyized FM broadcasts starts, the DOLBY FM switch on the NR MODE must be selected to its position and the DOLBY FM decoder operates so that Dolbyized FM broadcasts are decoded and can be enjoyed. At this time the SELECTOR can be in any positions, the DOLBY FM switch only is necessary for the reception of Dolbyized FM broadcasts.

### SETTING THE DOLBY STANDARD LEVEL TO RECORDING AND PLAYBACK

The purpose of the following adjustments is to achieve the proper Dolby levels by calibrating the recording and playback signals being applied to the Dolby processors.

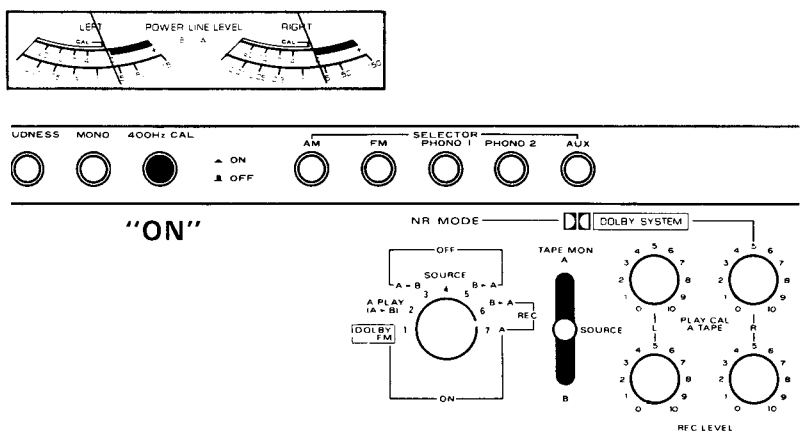
To perform this adjustment, the Standard Alignment Tape must be played on the tape deck (or recording system) connected to the receiver. However, if you do not have a Standard Alignment Tape, you can create a Dolby Alignment Tape in the following way for Dolby recording and playback.

### TO CREATE DOLBY ALIGNMENT TAPE

1. Load a blank tape (or insert a cassette) on the tape deck connected to the TAPE A jacks.
2. Set the 400 Hz CAL switch to ON and the NR MODE switch to REC-A.
3. Set the tape deck's monitor switch to its source position and adjust the tape deck's input level control so that it indicates a recording level of 0 VU.
4. In this condition, record the signal on the tape for about one minute. You have now created a Dolby Alignment Tape for the adjustment of your system.
5. Now turn the 400 Hz CAL switch and NR MODE switch OFF.

Please refer to the figure below.

LINE LEVEL METER




NR MODE POSITION FOR CREATING DOLBY ALIGNMENT TAPE

# OPERATING INSTRUCTIONS
## (WITH USING DOLBY UNIT)

This Dolby Alignment Tape can be used to adjust the Dolby recording characteristics of your receiver and the tape deck or recording system with which it will be used.

**Note:**

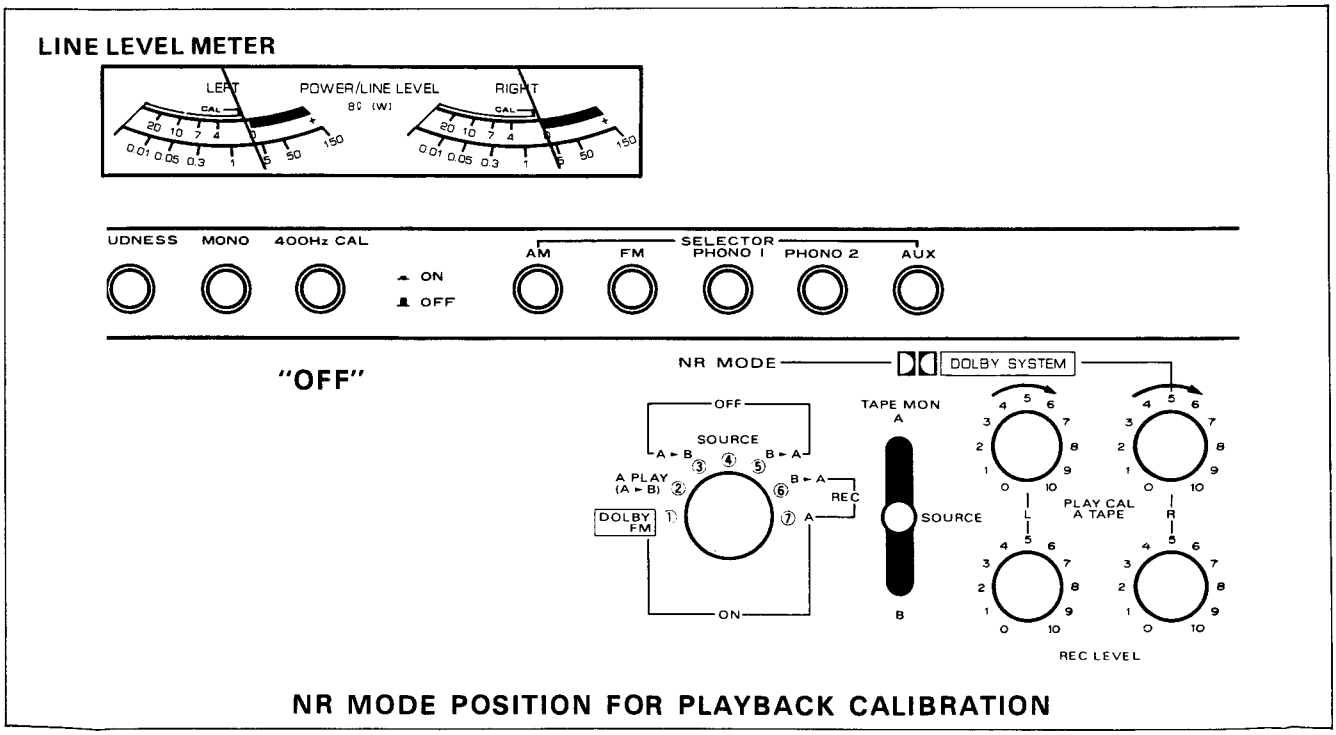
A home made Dolby Alignment Tape is a second best alternative to using a real Dolby Standard Alignment Tape. However, to adjust your system more accurately to the Dolby standard level, a Dolby Standard Alignment Tape is available from Kenwood. Contact the following office, specifying the model of the tape required.

**Dolby Standard Alignment Tape**
Model KST-11..... for Cassette Tape Deck
Model KST-12..... for Open-Reel Tape Deck

**TRIO-KENWOOD CORPORATION**
c/o Higashiyama Bldg. 7th floor
1-2, 1-Chome, Higashiyama
Meguro-ku, Tokyo
153 Japan

### PROCEDURE FOR PLAYBACK CALIBRATION

1. Connect a tape deck to the TAPE A jacks.
2. Set the Dolby NR MODE switch to A PLAY (A ► B).
3. Set the POWER/LINE LEVEL switch to line level.
4. If the tape deck has a monitor switch, set it to tape play.
5. Load the Dolby Alignment Tape on the tape deck.
6. Play the Dolby Alignment Tape.
7. If the tape deck has playback level controls, adjust these so that the tape deck's VU meters indicate 0 VU.
8. If the tape deck does not have playback level controls, proceed to Item 9. If it does not have VU meter, set the level controls to about 2/3 of their maximum.
9. Adjust the PLAY CAL controls (left and right) so that the LINE LEVEL meters (left and right) deflect to the Dolby CAL mark.
10. Now that Dolby Playback calibration is complete, do not adjust the PLAY CAL controls or the tape deck's Playback Level controls.
    Please refer to the figure below.




**NR MODE POSITION FOR PLAYBACK CALIBRATION**

# OPERATING INSTRUCTIONS
## (WITH USING DOLBY UNIT)

It will be necessary to re-calibrate the Dolby levels as described in the following manners:

1. When using tapes of different types (Standard, Low-Noise, $CrO_2$ etc.).
2. When changing over the setting of the tape deck. Otherwise, the controls will be set incorrectly. To avoid making mistakes after having set the controls, mark their positions with ribbon tape after making the adjustment.

### PROCEDURE FOR RECORD CALIBRATION

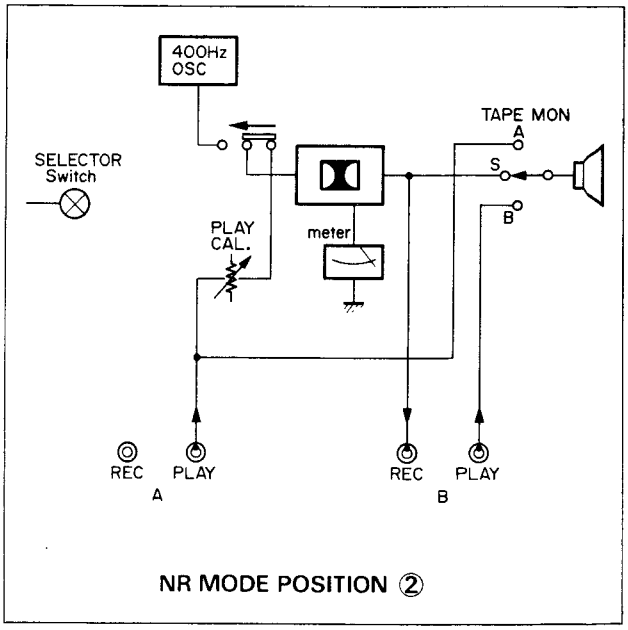
Without having calibrated the playback system, the recording system cannot be cablibrated, so first calibrate the playback system. As for playback calibration, calibrate the recording system with a tape loaded on the tape deck connected to the TAPE A jacks.

**Tape Decks**

1. Load a blank tape or insert a cassette in the tape deck.
2. Set the NR MODE switch to REC-A.
3. Set the 400 Hz CAL switch to ON.
4. Set the tape deck to the recording mode.
5. Adjust the tape deck's input level controls so that the tape deck's VU meters indicate 0 VU.
6. Now record the signal on the tape for about 15 seconds.
7. Set the 400 Hz CAL switch OFF and stop the tape deck, rewind the tape.
8. Set the Dolby NR MODE switch to A PLAY (A ▶ B) and the POWER/LINE LEVEL switch to LINE LEVEL.
9. Set the tape deck to playback.
10. Observing the right and left Level Meters, see if they deflect to the Dolby CAL Mark. If they do, the calibration is correct.
11. If the Level meters do not deflect to the Dolby CAL Mark, repeat adjustments of the tape deck's recording level controls so that the receiver's VU meters deflect to the Dolby CAL Mark. At this time, do not adjust the tape deck's playback level controls.

**Tape Decks of which Record and Playback Level Controls are the Same**

This type of tape deck is such that one control must be used to calibrate the recording and playback levels. After calibrating the recording (playback) level, mark the position of the knob. Then perform the adjustment of the playback (recording) system with reference to the marked position. Apart from this, calibrate in the same way as with a two-head deck.



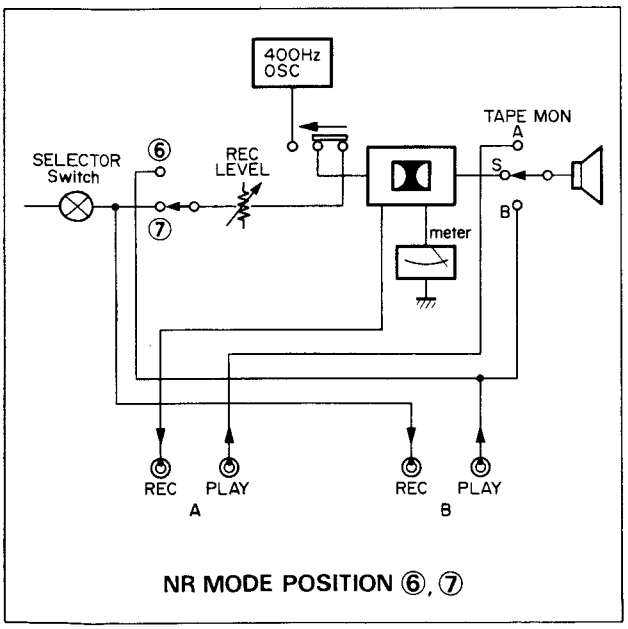
NR MODE POSITION ②

# OPERATING INSTRUCTIONS
## (WITH USING DOLBY UNIT)

This concludes the adjustment portion. For recording and playback, perform the following procedure:

**Dolbyized Recording from an Incoming "Flat" (Non-Dolbyized) Signal**

1. Connect a tape deck to the TAPE A jacks and set the controls to the positions determined in CALIBRATION.
2. Set the SELECTOR switch to correspond to the input from which you are to record (AM, FM, PHONO, AUX, MIC or Tape B).
3. Set the NR MODE switch to REC-A or REC-B ► A.
4. Adjust the REC level controls so that the level meter deflection is correct (around 0 dB). At this time, do not adjust the tape deck's Input and Output Level Controls.
   All adjustments should be with the REC level control.
5. Set the tape deck to the recording mode.




NR MODE POSITION ⑥, ⑦

**Recording Dolbyized FM Broadcasts**

If the receiver has been calibrated to make Dolbyized recordings, set the NR MODE switch on its DOLBY FM position to make Dolbyized recordings, adjusting the recording level with the recording level controls on the tape deck.
After decoding, a flat signal can be recorded on Tape B.

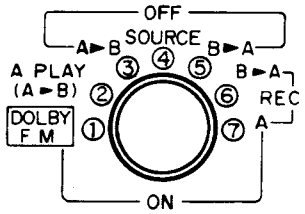
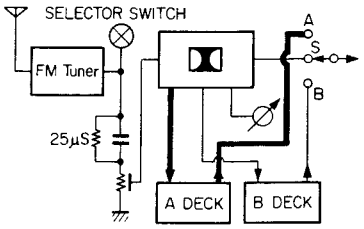
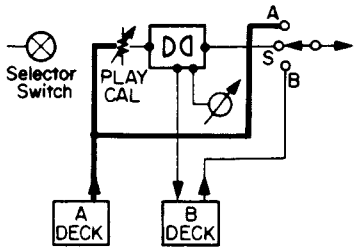
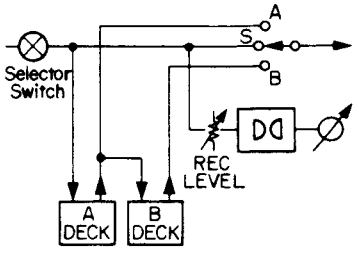
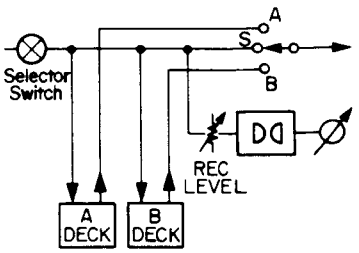
**To Play Back Dolby Tape**

1. If the tape deck connected to the TAPE A jacks has not been calibrated, do this. (See page 13 "PLAYBACK CALIBRATION".)
2. Set the TAPE MON switch to A.
3. Set the NR MODE switch to A PLAY (A ► B).
4. Playback using the tape deck. At this time, if there is a tape deck connected to the TAPE B jacks in the normal way, decoded signals with a flat frequency characteristic can be recorded.

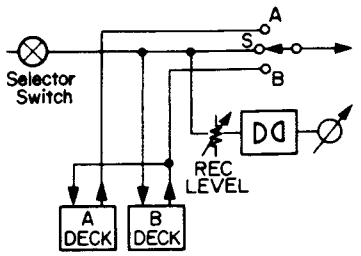
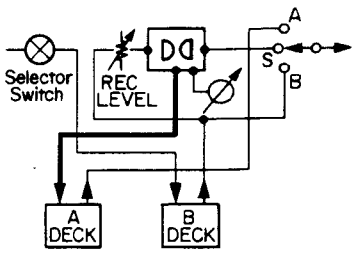
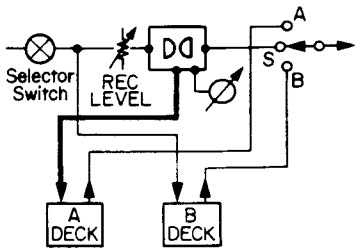
**Dubbing Dolby Encoded Tape from Tape A to Tape B**

Dubbing is done by using the NR MODE switch. When recording on the deck connected to the TAPE B jacks from the deck connected to the TAPE A jacks, calibrated by adjusting their output level controls in conjunction with each other.
("DOLBY NR MODE CHART" is furnished on pages 16 and 17 for your ready reference.)

# DOLBY NR MODE CHART

| NR MODE SWITCH / POSITION | NR MODE | BLOCK DIAGRAM |
|---|---|---|
| |  | ——— Bold line shows encorded signal |
| ① | **DOLBY FM**<br>This position is designed for only the DOLBY FM broadcasts.<br>And the recording of Dolby FM programs are available to TAPE A and B.<br>**TAPE A** .....Encoded signal<br>**TAPE B** .....Decoded signal<br>The positions of TAPE MON switch are as follows.<br>**SOURCE** ...Decoded Dolby FM<br>**A** .....Monitor the recording of TAPE A (Encoded)<br>**B** .....Monitor the recording of TAPE B (Decoded) |  |
| ② | The Dolbyized tape of the TAPE DECK A can be played back and copied.<br>The positions of TAPE MON switch are as follows.<br>**SOURCE** ...Playback sound of the Dolbyized tape<br>**A** .....Sound before passing through the Dolby circuit<br>**B** .....Copied sound |  |
| ③ | The signal does not pass through the Dolby circuit with the switch set to this position.<br>The positions of TAPE MON switch are as follows.<br>**SOURCE** ...Sound selected by the SELECTOR switch can be listened to while dubbing from A to B at SOURCE.<br>**A** .....Playback sound of the TAPE DECK A<br>**B** .....Playback sound of the TAPE DECK B |  |
| ④ | When the Dolby circuit or the dubbing circuit is not used, set the switch to this position (usual position). |  |

# DOLBY NR MODE CHART

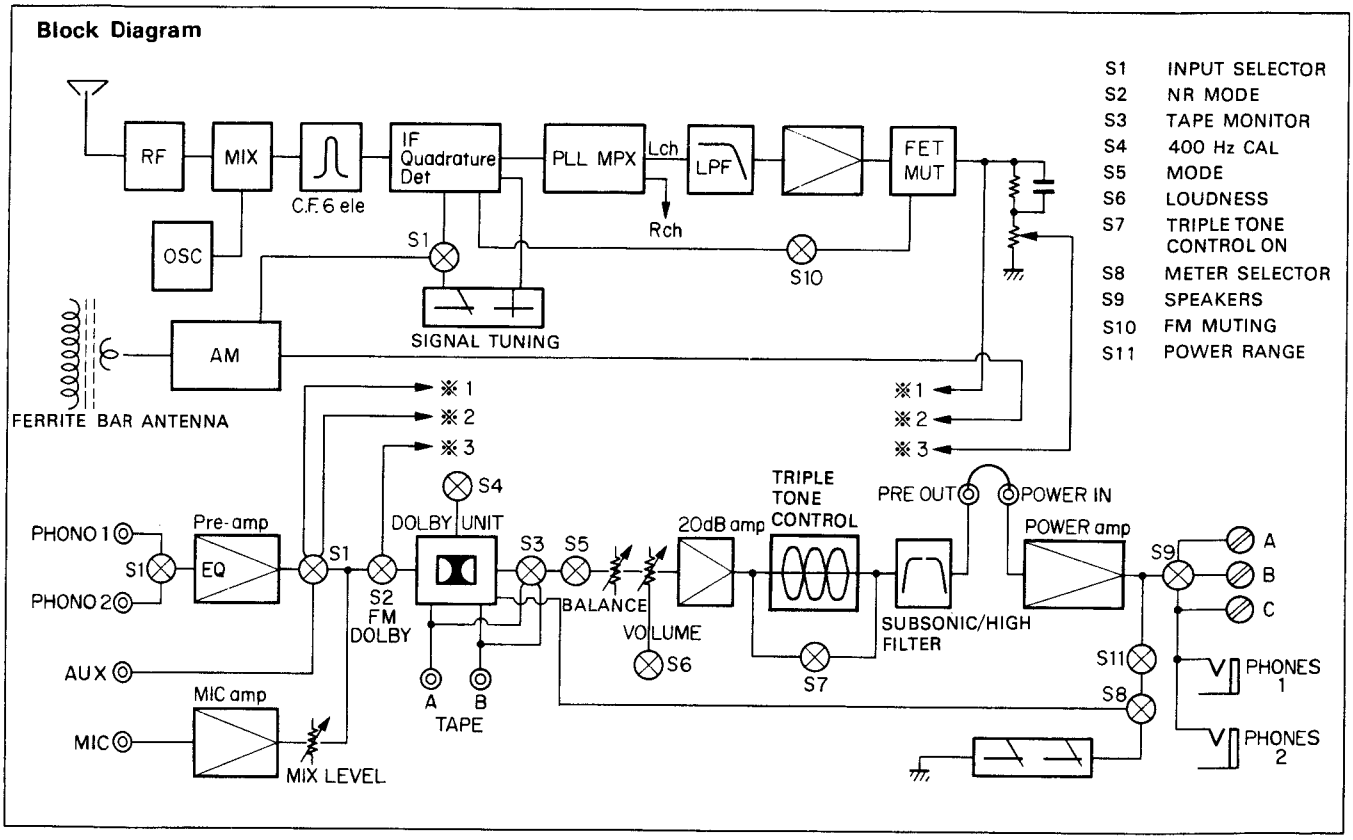
| | | |
|---|---|---|
| ⑤ | The signal does not pass through the Dolby circuit with the switch set to this position.<br>The positions of TAPE MON switch are as follows:<br>**SOURCE** ...Sound selected by the SELECTOR switch can be listened to while dubbing from B to A at SOURCE.<br>**A** .....Playback sound of the TAPE DECK A<br>**B** .....Playback sound of the TAPE DECK B |  |
| ⑥ | When modifying the Non-Dolbyized tape to the Dolbyized tape, set the switch to this position. The played back signal on the TAPE DECK B passes through the Dolby circuit, to be recorded on the TAPE DECK A. |  |
| ⑦ | When recording through the Dolby circuit, set the switch to this position.<br>The positions of TAPE MON switch are as follows.<br>**SOURCE** ...Sound selected by the SELECTOR switch can be listened to.<br>**A** .....Encoded sound on the tape A can be monitored.<br>**B** .....Recorded sound on the tape B can be monitored.<br>**Note:**<br>The tape A is the only tape that can be Dolby-recorded. |  |

## CAUTION

If the receiver's built-in Dolby system is to be used, adaptors to improve sound reproduction (Reverberation unit, Dynamic expander, Graphic equalizer, Active equalizer etc.) should be connected to the PRE OUTPUT and POWER INPUT jacks. If the adaptors are connected to the TAPE jacks, the Dolby system should not be used since this will spoil the Dolby effect. Be sure to turn off the AC POWER switch before connecting adaptors to the PRE OUTPUT and POWER INPUT jacks.

# BLOCK DIAGRAM

**Block Diagram**




## FM DE-EMPHASIS SWITCH

Prior to our shipment, this switch is set as below in accordance with the delivery area. Check the setting position before operating the unit. Improper setting will adversely affect the high frequency range.

Europe, Oceania and South Africa ..... 50μs
Others ..... 75μs

**NOTE:**

As for the Dolby FM, Set the NR MODE switch to DOLBY FM so that the de-emphasis of "25μs" has an effect on Dolbyized FM programs, regardless of either 50μs or 75μs position at the rear pannel.

# SPECIFICATIONS

## POWER AMPLIFIER SECTION

Power Output

**80 watts per channel minimum RMS, both channels driven, at 8 ohms from 20 to 20,000 Hz with no more than 0.03% total harmonic distortion.**

| | |
|---|---|
| **Both Channels Driven** | 110 + 110W 4Ω at 1 kHz |
| **Dynamic Power Output** | 280W 4Ω |
| **Total Harmonic Distortion** | 0.03% at rated power into 8Ω<br>0.01% at 1/2 rated power into 8Ω |
| **Intermoduration Distortion (60 Hz : 7 kHz = 4 : 1)** | 0.03% at rated power into 8Ω<br>0.01% at 1/2 rated power into 8Ω |
| **Power Bandwidth** | 5 Hz to 100,000 Hz |
| **Frequency Response** | 5 Hz to 100,000 Hz −1.5 dB |
| **Signal to Noise Ratio** | 115 dB (short circuited) |
| **Damping Factor** | 40 at 8 ohms |
| **Input Sensitivity/Impedance** | 1.0V/50 kΩ |
| **Speaker Impedance** | Accept 4Ω to 16Ω |

## PRE AMPLIFIER SECTION

| | |
|---|---|
| **Input Sensitivity/Impedance/Signal to Noise Ratio (IHF A curve)** | |
| **Phono 1** | 2.5 mV/50 kΩ/80 dB |
| **Phono 2** | 2.5 mV/50 kΩ/80 dB |
| **AUX** | 150 mV/50 kΩ/110 dB |
| **Tape A, B** | 150 mV/50 kΩ/110 dB |
| **Mic** | 1.5 mV/10 kΩ/70 dB |
| **Maximum Input Level for Phono** | 230 mV (RMS), T.H.D. 0.03% at 1,000 Hz |
| **Frequency Response** | |
| **Phono** | RIAA standard 30 Hz to 20 kHz ±0.3 dB |
| **AUX and Tape** | 10 Hz to 40,000 Hz −1.0 dB |
| **Tone Control** | |
| **Bass** | ±12 dB at 50 Hz |
| **Mid** | ±12 dB at 800Hz |
| **Treble** | ±12 dB at 15 kHz |
| **Loudness Control (−30 dB Vol.)** | + 10 dB at 100 Hz |
| **Subsonic Filter** | −15 dB at 18 Hz |
| **High Filter** | −6 dB at 10 kHz |
| **Output Level/Impedance** | |
| **Tape REC (Pin)** | A : 150 mV/100Ω<br>B : 150 mV/100Ω |
| **(DIN)** | A : 30 mV/80 kΩ<br>B : 120 mV/80 kΩ |
| **Pre Out** | 1.0V/1 kΩ |

## FM TUNER SECTION

| | |
|---|---|
| **Usable Sensitivity** | 10.3 dBf (1.8 μV) |
| **50 dB Quieting Sensitivity** | |
| **Mono** | 14.7 dBf (3.0 μV) |
| **Stereo** | 37.2 dBf (40 μV) |
| **Signal to Noise Ratio at 65 dBf** | |
| **Mono** | 80 dB |
| **Stereo** | 74 dB |
| **Total Harmonic Distortion at 65 dBf** | |
| **Mono** | 0.1% at 1 kHz |
| **Stereo** | 0.15% at 1 kHz |
| **Frequency Response** | 30 Hz to 15,000 Hz +0,5, −1.0 dB |
| **Capture Ratio** | 1.0 dB |
| **Alternate Channel Selectivity** | 75 dB |
| **Spurious Response Ratio** | 85 dB |
| **Image Response Ratio** | 60 dB |
| **IF Response Ratio** | 75 dB |
| **AM Suppression Ratio at 65 dBf** | 65 dB |
| **Stereo Separation** | 48 dB at 1,000 Hz<br>35 dB at 50 Hz to 15,000 Hz |
| **Sub Carrier Product Rejection** | 46 dB |
| **Antenna Impedance** | 300Ω balanced and 75Ω unbalanced |
| **FM Frequency Range** | 88 MHz to 108 MHz |

## AM TUNER SECTION

| | |
|---|---|
| **Usable Sensitivity** | 20 μV |
| **Signal to Noise Ratio** | 50 dB |
| **Image Rejection** | 55 dB |
| **Selectivity** | 30 dB |
| **IF Rejection** | 30 dB |
| **Total Harmonic Distortion** | 0.5% |

## GENERAL

| | | | |
|---|---|---|---|
| **Power Requirement** | | 50/60 Hz, 110-120/220-240V | |
| **Power Consumption** | | 550 watts at full power | |
| **A.C. Outlet** | | Switched 2, Unswitched 1. | |
| **Dimensions** | W | 624 mm | (24-9/16") |
| | H | 206 mm | (8-1/8") |
| | D | 460 mm | (18-1/8") |
| **Weight** | | 19.8 kg | (43.5 lb) |
| **(Gross)** | | 24.3 kg | (53.6 lb) |

**NOTE:**

Kenwood follows a policy of continuous advancements in development. For this reason specifications may be changed without notice.